



April 11, 2025

UPLOADED BY VIRGIN GALACTIC TO ECFS: [HTTPS://WWW.FCC.GOV/ECFS/](https://www.fcc.gov/ecfs/)

Federal Communications Commission (Commission or FCC)

Attn: Secretary

45 L Street NE

Washington, DC 20554

Re: Virgin Galactic's Comments On The Commission Seeking Public Input On Identifying FCC Rules For The Purpose Of Alleviating Unnecessary Regulatory Burdens (Public Notice)

Public Notice: DA-25-219

Docket Number: GN Docket No. 25-133 (In Re: Delete, Delete, Delete)

To Federal Communications Commission,

As requested in the above referenced Public Notice, Virgin Galactic Holdings, Inc. (Virgin Galactic), publicly traded on the NYSE under ticker symbol SPCE, respectfully submits this letter identifying "FCC rules for the purpose of alleviating unnecessary regulatory burdens" that, if repealed or modified, would allow Virgin Galactic's advanced technology and innovative capabilities to flourish, thereby allowing the U.S. to remain at the forefront of space technology and commercial space capabilities.

I. About Virgin Galactic

Virgin Galactic is an aerospace and space travel company, pioneering human spaceflight for private individuals and researchers with its advanced air and space vehicles. Virgin Galactic is the world's first FAA-licensed commercial spaceline approved to operate its human spaceflight system to fly spaceflight participants to space. Virgin Galactic's spaceflight system includes both a spacecraft and a high altitude launch vehicle with a global customer base for both research and experience spaceflights, currently operating from Spaceport America in New Mexico. Given Virgin Galactic's continued business plans in the space industry with high cadence of flights, it has a strong interest in obtaining frequencies with certainty, flexibility, impartiality through a streamlined approach.

II. Summary of Virgin Galactic's Previously Submitted Overall Comments on the Commission's New Proposed Space Launch Licensing Process

The Commission previously requested comments on its ***Licensing and Coordination Procedures For The Space Launch (ET Docket No. 13-115)*** (Proposed Procedure). On January 23, 2025, Virgin Galactic submitted its comments on this Proposed Procedure, those comments are attached separately for reference. In summary, Virgin Galactic responded that the Proposed Procedure created too much complexity for national non-governmental operators when applying for a frequency license, and the Proposed Procedure did not take into consideration the operations of commercial human suborbital spaceflight companies. More specifically, Virgin Galactic recommended in its previous comments:

1. Identified redundancies should be deleted;
2. Notice time frames that are too long and must be shortened;
3. More efficient coordination between licensees and the Space Launch Frequency Coordinator; and,
4. Reconsideration of the 5 MHz S band limitation on flights.

Virgin Galactic previously submitted comments and its recommendations remain outstanding, and, if adopted by the Commission it would further alleviate unnecessary regulatory burdens.



III. Additional Considerations for Streamlining

The U.S. is the leader in commercial human spaceflight and is leading in space technology innovation. The regulations as currently written, fail to account for the diversity of operations in commercial spaceflight, in particular, suborbital flights. In addition to streamlining the regulations, Virgin Galactic recommends amending the current regulations to accommodate hybrid air-launch and suborbital human operations.

A. Recommendation: “Power Flux Density” Should Begin Measurement at Mid-Air Launch.

47 CFR 26.303(b) allows a spacecraft to transmit at strengths up to twenty-five (25) watts during the “first stage of a launch,” which FCC defines as the first fifteen (15) minutes of a mission, and then after the first fifteen (15) minutes the operator must ensure the strength at the ground (e.g., “power flux density”) is lowered. Unfortunately, in Virgin Galactic’s unique space flight system, by the time Virgin Galactic launched its spacecraft, compliance would result in Virgin Galactic transmitting at approximately one (1) watt which does not allow for a comfortable margin cushion to maintain signal lock.

Due to Virgin Galactic’s unique space flight system, it requests “power flux density” be measured from its mid-air launch, not ground launch. If measured from ground launch, Virgin Galactic is only able to meet the “power flux density” requirement, if it dials back its vehicle transmission power to one (1) watt or less, a signal strength which theoretically allows Virgin Galactic’s tracking antenna on the ground to remain locked to the signal but doesn’t allow for a comfortable margin cushion to maintain signal lock. For comparison, Virgin Galactic previously transmitted at ten (10) watts during its 2024 missions.

To reiterate, Virgin Galactic has a unique air-launch flight system which does not meet the traditional definitions of “first stage” that may be applied to vertical take-off launch vehicles. Virgin Galactic believes that its “first stage of launch” should be measured from its 50,000 feet mid-air launch as its spacecraft is released from its high altitude launch vehicle, which occurs about 45-50 minutes after horizontal take-off from a traditional runway. With this unique space flight system, Virgin Galactic needs to be able to transmit at strengths greater than one (1) watt.

Another benefit to Virgin Galactic’s flight profile, in reducing the interference footprint, is that from its spacecraft’s 50,000 foot mid-air release to landing (end of transmissions) the remaining flight only lasts for a period of approximately fifteen (15) minutes. And, during the final three to four minutes, Virgin Galactic’s radiated interference “footprint” on the ground quickly grows smaller and smaller as its spacecraft descends. In other words, Virgin Galactic’s interference footprint after apogee diminishes with increasing time, which is atypical from a traditional space re-entry operation.

Therefore, Virgin Galactic proposes the following changes to 47 CFR 26.303(b)’s “power flux density” section. 47 CFR 26.303(b) is set forth verbatim below and includes Virgin Galactic **blacklines** proposed changes where appropriate:

(b) **2200-2290 MHz**. During the first stage of a launch, **which for air-launch spaceflight system launches begins with mid-air release**, the EIRP of any station in the 2200-2290 MHz band of the Space Launch Services shall not exceed 25 Watts and the transmitter output power shall not exceed 25 Watts. In addition, the power flux-density at the Earth’s surface produced by emissions from a transmitter operating after the first stage of a launch for all conditions and for all methods of modulation shall not exceed the following limits:

- (1) -154 dB(W/m²) in any 4 kHz for angles of arrival less than 5° above the horizontal plane;
- (2) $-154 + 0.5 (\delta - 5)$ dB(W/m²) in any 4 kHz for angles of arrival δ (degrees) between 5° and 25° above the horizontal plane; and



(3) –144 dB(W/m²) in any 4 kHz for angles of arrival between 25° and 90° above the horizontal plane.

B. “Telemetry” Definition Should be Expanded

The commercial space marketplace is continuing to evolve as technological changes rapidly advance. Due to the rapid technological advances, there is a need to expand 47 CFR 26.5 definition of “Telemetry.” Commercial spaceflight has moved to a digital format and the current definition of “Telemetry” does not reflect this digital transformation. Currently, the “Telemetry” definition does not allow Virgin Galactic to stream digital content (e.g., video and audio) intended for its internal use. Further, the digital transmission of video and audio does not compete with commercial broadcasters as the transmission occurs on Virgin Galactic space-based media channel.

Therefore, Virgin Galactic proposes the following changes to 47 CFR 26.5’s “Telemetry” definition. 47 CFR 26.5 is set forth verbatim below and includes Virgin Galactic **blacklines** proposed changes where appropriate:

Telemetry. The transmission of **non-voice** signals for the purpose of automatically indicating or recording measurements at a distance from the measuring instrument. In the context of space launch operations, telemetry is diagnostic information, transmitted from the launch vehicle to ground controller stations during the flight, which allows the ground controller station to track the performance of the launch vehicle. **Signals may also include digital audio and/or video.**

Additionally, the FCC’s wireless telemetry should mirror the FAA’s definition of “aeronautical mobile telemetry”¹ (AMT) which includes the use of audio and video within the definition of “Telemetry.” Avoiding duplicative and conflicting definitions will ease burden on industry and aid in the efficient use of the Commission’s resources.

IV. Summary

In sum, Virgin Galactic encloses its previously submitted feedback to the Commission’s Public Notice *Mechanism And Criteria For Selecting Space Launch Frequency Coordinator* – WT Docket No. 24-687 as all of its previous enclosed suggestions will modernize the FCC’s rules to bring them current as the marketplace and technological changes continue to evolve. In addition, Virgin Galactic’s other suggestions will allow for the regulations to keep pace with U.S. technological innovation.

Virgin Galactic sincerely appreciates the opportunity to submit its comments to the Public Notice. Virgin Galactic’s requested changes will promote flexibility, certainty and streamlined communications to allow it to effectively use frequencies to operate daily suborbital space launch and reentry operations.

I can be reached at zachary.zaharek@virgingalactic.com to address any further Commission questions or comments.

VIRGIN GALACTIC HOLDINGS, INC.

Sincerely,

Zachary Zaharek

Zachary Zaharek
Senior Director, Associate General Counsel

Enclosure: Virgin Galactic’s January 23, 2025 Letter to FCC

¹ See Virgin Galactic’s January 23, 2025 submission which references the FAA AMT definition, p.4.



January 23, 2025

UPLOADED BY VIRGIN GALACTIC TO ECFS: [HTTPS://WWW.FCC.GOV/ECFS/](https://www.fcc.gov/ecfs/)

U.S. Federal Communications Commission (Commission)

Attn: Wireless Telecommunications Bureau

45 L Street NE

Washington, DC 20554

Re: Virgin Galactic's Comments On *Licensing and Coordination Procedures For The Space Launch Service* (Proposed Procedure)

Docket Number: ET Docket No.13-115

To U.S. Federal Communications Commission's Wireless Telecommunications Bureau (Bureau),

Virgin Galactic Holdings, Inc. (Virgin Galactic) respectfully submits its comments to the Bureau's Proposed Procedure in the above referenced matter.

I. About Virgin Galactic. Virgin Galactic is an aerospace and space travel company, pioneering human spaceflight for private individuals and researchers with its advanced air and space vehicles. Virgin Galactic is the world's first FAA-licensed commercial spaceline approved to operate its human spaceflight system to fly spaceflight participants to space. Virgin Galactic's spaceflight system includes both a spaceship and a mothership with a global customer base for both research and experience spaceflights, currently operating from Spaceport America in New Mexico. Given Virgin Galactic's continued business plans in the space industry with high cadence of flights, it has a strong interest in obtaining frequencies with certainty, flexibility, impartiality, and a streamlined approach. Virgin Galactic has a strong interest in this Proposed Procedure and respectfully proposes edits and comments to create an effective and efficient process for all commercial Space Launch Services licensees (Licensee).

II. Virgin Galactic's Overall Comments on the Bureau's Licensing Process (Proposed Procedure – Section II). Virgin Galactic's responses in this letter follow the order of the Proposed Procedure. Some of the Proposed Procedures include lists, while other sections provide guidance in general prose. To the extent Virgin Galactic can provide **blackline** edits to the lists, it does so below. Otherwise, Virgin Galactic responds to the Bureau's Proposed Procedure Public Notice with general comments. The Proposed Procedure is complex and it outlines how to apply for a national non-governmental frequency license; what data a Licensee would provide the Space Launch Frequency Coordinator (Coordinator); and, what a Licensee must upload into the Universal Licensing System (ULS) post-frequency coordination.

Virgin Galactic's overall comments are meant to further streamline the above processes by focusing on:

1. Redundancies that should be deleted;
2. Sections that are not applicable to suborbital flights;
3. Notice time frames that are too long and must be shortened;
4. Decision controls that should be further given to the Coordinator; and,
5. The reconsideration that is necessary to liberalize the constrained 5 MHz band to allow broadening of the spectrum for suborbital flights.

The below follows the Proposed Procedure format and includes both Virgin Galactic comments and **blacklines** where appropriate:

A. Section II(A) - "Application for Nationwide License." Virgin Galactic has no comments to this Section A.



B. Section II(B) – “Launch Site and Station Registrations.” Virgin Galactic has some comments to this Section B. See below for details.

1. Data for Initial Registration - subsection II(B)(1)

- *Launch site details* - subsection II(B)(1)(1)
Virgin Galactic has no comments.
- *Itinerant and mobile station details* - subsection II(B)(1)(2)
Virgin Galactic has no comments.
- *Launch vehicles as mobile stations* - subsection II(B)(1)(3);
Virgin Galactic refers the Bureau to its 5 MHz limitation comment Part C, Item 2 below.
- *Fixed and base station details* - subsection II(B)(1)(4);
Virgin Galactic refers the Bureau to its 5 MHz limitation comment Part C, Item 2 below.

2. Requests for Bandwidth in Excess of 5 Megahertz

Although the Bureau is not specifically seeking comment in this section, Virgin Galactic requests that the Bureau consider revisiting the 5 MHz bandwidth limitation as well as how the requests for more than 5MHz are granted. Currently, all Licensees must file a request for more than 5 MHz during the application stage with the Commission. In the interim, to support these requests in a dynamic operational context, Virgin Galactic proposes to also empower the Coordinator to grant bandwidth requests in excess of 5 MHz as the Coordinator will have an understanding of the day-to-day spectrum use. On a mission-by-mission basis, the Coordinator, during deconfliction, will know if more bandwidth can be granted to Licensees. (See Virgin Galactic’s response - Part C, Item 2 below.)

C. Section II(C) – “Frequency Coordination.” Virgin Galactic has no comments under Sections II(C)(1)(1-7). However, under Section II(C)(1)(8), some of the data requested below does not apply to Virgin Galactic’s suborbital business model. To provide varied Licensees flexibility, Virgin Galactic inserted the phrase, “..., if applicable” when needed.

1. Data Requirements for Frequency Coordination Requests - subsection II(C)(1)(8)

The Bureau Section’s language in II(C)(1)(8) is below. Virgin Galactic’s **blackline** reflects its requested changes.

8. Launch details:

- a. Name of launch vehicle;
- b. Launch mission name and/or designator number;
- c. Launch and reentry date/time window (primary and backup), including launch window open time, and the duration of each window;
- d. List of objects to achieve orbit during launch operation, **if applicable**;
- e. Total elapsed time from launch to end of transmission;



- f. Requested frequencies used for launch and reentry, including required center frequency(ies);
- g. Orbital location (orbit insertion), **if applicable;**
- h. Mean launch azimuth (degrees, clockwise from the North);
- i. Ground track from lift-off until end of transmission, **if applicable;**
- j. ECF Cartesian Vectors Format (position and velocity vs. time or position, velocity, and acceleration vs. time) in one minute time steps (at least) for each phase of launch through the end of transmission;
- k. A plot image of the two-dimensional ground track of the launch vehicle including demarcations for important mission events (e.g., main engine cut-off (MECO), stage separation, payload jettison, passivation);
- l. Duration of transmission(s), to include on/off time (nominal and maximum durations) for each transmitter and receiving station(s) corresponding to the on/off times, **if applicable;**
- m. Reentry landing zone;
- n. If applicable, expected reentry coordinates and the landing trajectory (from the reentry point) of reusable launch vehicles and boosters;
- o. Maximum heights above ground level and above sea level for both launch and reentry activity; and,
- p. Operational contact information, including name, e-mail address, and telephone number.

2. **Coordination Procedures** - subsection II(C)(2)

Consider "Blanket Mission Requests." Virgin Galactic's plans are to launch every three (3) days. This high launch cadence requires efficient and timely authorizations and operations. Therefore, Virgin Galactic requests that the Bureau enable Licensees with high flight cadences of similar, if not nearly identical profiles, an option to submit requests that cover several missions over a longer period of time. Otherwise, submitting individual mission requests per the proposed timelines would become burdensome to both the Licensee and the Coordinator managing the requests.

Empower Coordinator to Authorize More than 5 MHz. Virgin Galactic proposes that, in the interim, as FCC considers widening the bandwidth limitation, that the Coordinator be given discretion to authorize more than 5 MHz. As Virgin Galactic understands it, one of the main purposes of the Coordinator is to take all requests from respective licensees, that wish to launch for that day, and deconflict so that each Licensee may safely launch within certain frequencies. The Coordinator is in the best position to release bandwidth, while ensuring there is no conflict with other users.

Notice Requests Are Too Long. As more fully discussed below, Virgin Galactic believes the notice requests are too long and may impede efficiency and operability of it business. The Coordinator should be allowed to provide more leeway in making decisions on shorter notice.

- a. **Non-Federal Coordination in the 2025-2110 MHz Band** - subsection II(C)(2)(a).
Virgin Galactic has no comments to this subsection.



- b. **Non-federal Coordination in the 2360-2395 MHz Band-** subsection II(C)(2)(b). Virgin Galactic agrees that the proposed 96-hour pre-launch initial notification/coordination to Part 87 frequency advisors is reasonable.
- c. **Federal Coordination-** subsection II(C)(2)(c). As set forth in this section (a) above, Virgin Galactic requests that the Bureau consider coordination request submittal procedures that more align to the interests of high-cadence operations. If the mission requirements do involve combinations of spectrum allocations, then Licensees should expect that the involved Coordinator have timely processes to support quick assessments and responses to Licensees. Virgin Galactic proposes that the 60-day notice periods are too long to support the fast turn-around times with anticipated flight cadences for high-rate commercial operators and suggest shorter and more efficient 15- or 30-day notice periods.
- d. **Changes to Launch Parameters** - subsection II(C)(2)(d). Virgin Galactic requests that the Bureau consider removing submissions with specified cut-off dates and instead allow the Coordinator to be empowered to receive and assess requests for changes to the extent possible, right up to launch.

D. Section II(D) – “Post-Frequency Coordination Launch Registrations.” Virgin Galactic believes all information sought post-coordination would have already been provided to the Coordinator during the individual frequency coordination request. So, in the spirit of efficiency, only data that deviates from the information previously provided should be required to be uploaded into the ULS, otherwise the same launch data will be uploaded twice. This redundancy is not efficient.

Further, Virgin Galactic asks that any launch trajectory information be kept confidential as it considers certain mission parameters as sensitive proprietary information.

III. Summary. Virgin Galactic also submitted feedback to the Bureau’s Public Notice *Mechanism And Criteria For Selecting Space Launch Frequency Coordinator* – WT Docket No. 24-687.

As an additional note, Virgin Galactic urges the Commission to reconsider the definition of telemetry in this context. Wireless telemetry should be similar to FAA’s definition of “aeronautical mobile telemetry” (AMT) which includes the use of audio and video within the definition of “telemetry.”¹ Avoiding duplicative and conflicting definitions will ease burden on industry and aid in the efficient use of the Commission’s resources.

Virgin Galactic sincerely appreciates the opportunity to submit its comments to the Bureau’s Proposed Procedure. Virgin Galactic requested changes will promote flexibility, certainty and streamlined communications to allow it to effectively use frequencies to operate daily suborbital space launch and reentry operations.

VIRGIN GALACTIC HOLDINGS, INC.

Sincerely,

Zachary Zaharek
Senior Director, Associate General Counsel

¹ The AMT definition was set forth in FAA’s April 29, 2016 *Report to Congress on Aeronautical Mobile Telemetry* (Report). In this Report FAA describes AMT as including “video” as well as “high-definition video” (pps1 &7).